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User's Manual

English

APC Smart-UPS®

1400 VA 3U Rack and Stack
Uninterruptible Power Supply
120 Vac

990-1021, Revision 1 5/00

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CHAPTER 1: SAFETY INFORMATION

This Safety Guide contains important instructions that should be followed during the installation and maintenance of the APC equipment and batteries. It is intended for APC customers who setup, install, relocate, or maintain APC equipment.

Conventions Used in this Manual

This section defines the symbols used throughout this manual. Carefully read all information boxes and abide by the instructions.

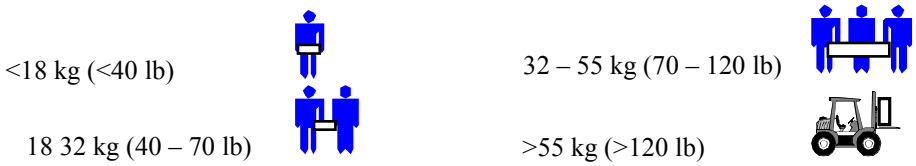
The WARNING sign denotes a serious hazard. It calls attention to a procedure, practice, condition, or the like, which, if not correctly performed or adhered to, could result in injury to personnel.

The CAUTION sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of all or part of the product.

The NOTE sign denotes important information. It calls attention to a procedure, practice, condition, or the like, which is essential to highlight.

Handling Safety

- Be careful. Do not lift heavy loads without assistance.



- Equipment with casters is built to move on a smooth surface without any obstacles.
- Do not use a ramp inclined at more than 10°.
- This equipment is intended for installation in a temperature-controlled indoor area (see ***Appendix A: Specifications***, page 25, for exact temperature range), free of conductive contaminants.

Electrical Safety

- To reduce the risk of fire, connect only to a circuit provided with a 20 Amp maximum branch circuit overcurrent protection in accordance with the National Electrical Code ANSI/NFPA.
- Do not work alone under hazardous conditions.
- Check that the power cord(s), plug(s), and sockets are in good condition.
- Do not block the air vents on the front and rear panels of the UPS.

Deenergizing Safety

- If the equipment has an internal energy source (the battery), the output may be energized when the unit is not connected to an AC power outlet.
- To deenergize **pluggable equipment**: first press the Off button for more than one second to switch the equipment off. Next disconnect the equipment from the AC power outlet. Finally, disconnect the battery.
- Pluggable equipment includes a protective earth conductor which carries the leakage current from the load devices (computer equipment). Total leakage current must not exceed 3.5 mA.
- Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly effect its safety or effectiveness is not recommended.

Battery Safety

- This equipment contains potentially hazardous voltages. Do not attempt to disassemble the unit. The only exception is for equipment containing batteries. Battery replacement using the procedures below is permissible. Except for the battery, the unit contains no user serviceable parts. Repairs are performed only by factory trained service personnel.
- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or mutilate batteries. They contain an electrolyte which is toxic and harmful to the skin and eyes.
- To avoid personal injury due to energy hazard, remove wrist watches and jewelry such as rings when replacing the batteries. Use tools with insulated handles.
- Replace batteries with the same number and type of batteries as originally installed in the equipment.

Replacement and Recycling of Batteries

See your dealer or ***Replacing the Battery***, page 21, for information on replacement battery kits and battery recycling.

About Your UPS

This APC Uninterruptible Power Supply (UPS) is designed to prevent blackouts, brownouts, sags and surges from reaching your computer and other valuable electronic equipment. This UPS also filters out small utility line fluctuations and isolates your equipment from large disturbances by internally disconnecting from the utility line, while supplying power from its internal batteries until the utility line returns to safe levels.

The UPS has a "rack and stack" design that provides two mounting options. The UPS can be mounted in a 19-inch equipment rack or stacked with other equipment. Hardware is provided for either option.

Limited Warranty

American Power Conversion (APC) warrants its products to be free from defects in materials and workmanship for a period of two years from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. To obtain service under warranty you must obtain a Returned Material Authorization (RMA) number from customer support (see ***Service***, page 24). Products must be returned with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. This warranty does not apply to equipment which has been damaged by accident, negligence, or misapplication or has been altered or modified in any way. This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase.

EXCEPT AS PROVIDED HEREIN, AMERICAN POWER CONVERSION MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL APC BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, APC is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise.

How To Contact APC

Internet http://www.apcc.com/contact

North America

Phone	1.800.800.4272
Fax	1.401.788.2743

Latin America

Argentina	0800.9.APCC (0800.9.2722)
Brazil	0800.12.72.21
Colombia	980.15.39.47
Mexico	95.800.804.4283
Uruguay	000.413.598.2139
Venezuela	8001.2856
Email	apctchla@apcc.com

If you ordered a Smart-UPS SU1400RMXL3UX171 unit, please refer to the red addendum sheet (part number 990-1023) for contact information.

CHAPTER 3: INSTALLING YOUR SMART-UPS

Unpacking

APC has taken care to design robust packaging for your product. However, accidents and damage may occur during shipment.

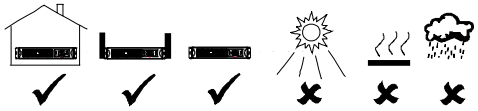
Inspection

Inspect the UPS upon receipt. Notify the carrier and dealer if there is damage. The packaging is recyclable; save it for reuse or dispose of it properly.

Contents

The shipping package contains the UPS, its front panel bezel (packaged separately), mounting rails, mounting cleats, hardware packet (necessary for rack mounting the UPS), software, two serial cables, one RJ-45 network cable, and product documentation.

Placement



Install the UPS in a protected area that is free of excessive dust and has adequate air flow. Do not operate the UPS where the temperature and humidity are outside the specified limits.

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the warranty.

How To Install the Smart-UPS

To install the UPS follow these five steps:

1. Place the UPS where it will be used. (This step includes mounting the UPS in a rack if desired.)
2. Connect the batteries and attach the front bezel.
3. Connect the equipment to the UPS.
4. Turn on the UPS.
5. Install PowerChute® software (optional) and accessories.

This section describes each step in detail.

Place The UPS Where It Will Be Used

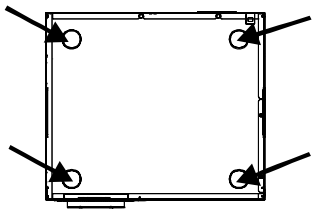
Select a location with adequate air flow that is free from excessive dust. Ensure that the air vents on the front and rear of the UPS are not blocked. Allow at least one inch of space on both sides.

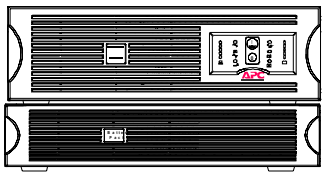
The UPS requires two people to install due to its weight.

To lighten the UPS, you may remove the batteries while you position the UPS or mount it in the rack. Refer to ***Replacing the Battery***, page 21, for instructions on how to remove the batteries.

- UPSs are heavy. Select a location sturdy enough to handle the weight. For rack mounting, install the UPS at or near the bottom of the rack.
- Do not operate the UPS where temperature or humidity are outside the limits listed in ***Appendix A: Specifications***, page 25.

To Stack the Units





1. Unpack the four (4) mounting feet shipped in the literature kit.
2. Turn the UPS on its side so the bottom surface is accessible.
3. Locate the indentations on the bottom of the UPS that mark the feet position (indicated by arrows in the figure to the left).
4. Peel away the protective film on the back of the feet and press hard to affix the feet to the UPS.
5. Turn the unit rightside up and place it either on the floor or on an optional battery pack (shown). The battery pack cover has indentations for feet on the bottom of either a UPS or another battery pack.
6. Skip to ***Connect the Batteries and Attach the Front Bezel***, page 9, to complete the installation.

- **Do not step on the UPS. The UPS chassis is not designed to support additional weight.**
- **If you are stacking the UPS with an external battery pack, position the UPS on top of the 2U battery pack. The top of the battery pack has indentations for proper placement of the feet on the bottom of the UPS.**

To Mount the UPS in a Rack

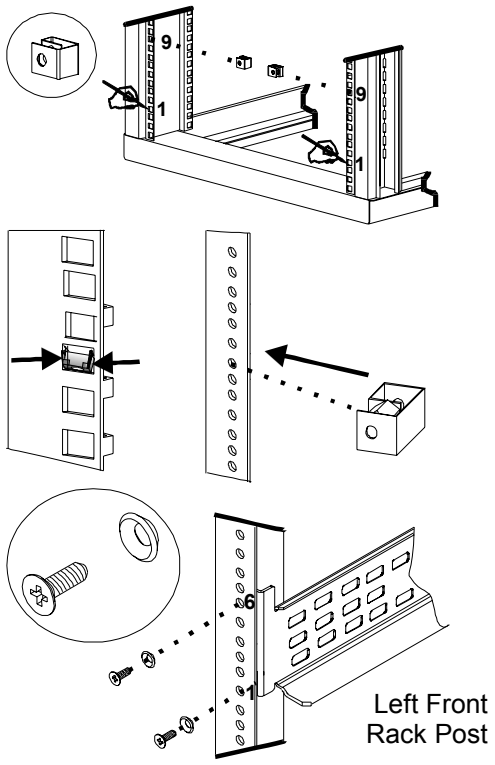
The UPS comes with standard 19-inch (46.5 cm) rack mount brackets (in the literature kit) and mounting rails and cleats. There are three steps to install the UPS in a rack. This section describes each in detail.

1. Install the mounting rails in the rack (required for four-post racks only).
2. Attach the mounting hardware to the UPS.
3. Load the UPS into the rack and fasten the mounting brackets.

Install the Mounting Rails in the Rack

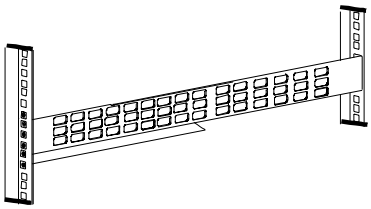
The mounting rails are designed to fit a four-post rack. The rack can have any of the common types of equipment mounting holes (square, round-threaded, or round-non-threaded). All necessary hardware is provided.

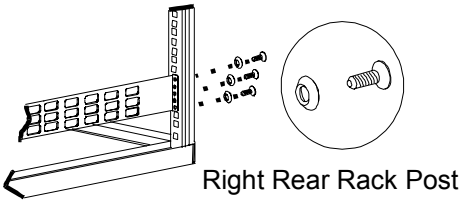
If you are using a two-post rack, use only the mounting brackets to mount the UPS. Position the mounting brackets in the mid-point position.



1. Determine where in the rack you will mount the UPS. The SU1400 requires a space of 3U. Some racks have tick marks to indicate the U-spaces.
2. Locate the designated U-space and, counting from the bottom, mark holes 1 and 9 on each front post. The bottom screw on the mounting rail will attach to the bottom hole (hole 1) in the U-space.
3. Prepare the rack holes, if necessary. Racks with threaded holes require no preparation.

   If your rack has round holes, insert a clip nut (provided) into hole 9.
   If your rack has square holes, insert either a clip or cage nut into hole 9 (cage nut shown).
4. Align the bottom hole on the mounting rail with the bottom hole in the U-space (hole 1). Position the rail so that the lip of the rail is on the inside bottom.
5. Insert a flat, Phillips head screw (10-32) and conical washer into hole 1.
6. Insert another screw and washer into the top hole on the rail (hole 6) to securely attach the front rail to the rack.





Right Rear Rack Post

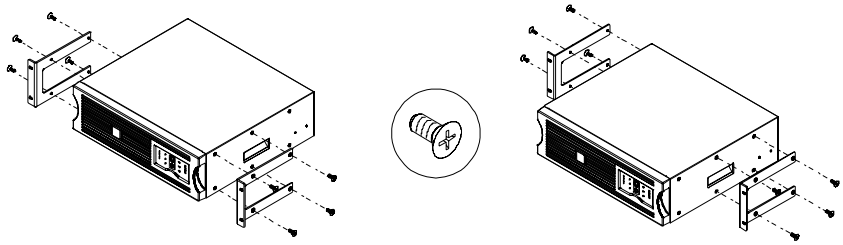
7. Expand the rail so that it spans from the front rack post to the back rack post.

8. Use three screws and washers to attach the rail to the back rack post. Use the same hardware (10-32 flat head screws and conical washers) used in step 5.

9. Repeat steps 5 through 8 for the other rail.

Attach the Mounting Hardware to the UPS

- Each mounting bracket attaches to the UPS with four (4) screws, included.
- Two sets of bracket holes are located on the sides of the UPS. Attach the mounting brackets in the forward position for a four-post rack or the mid-point position for a two-post rack.

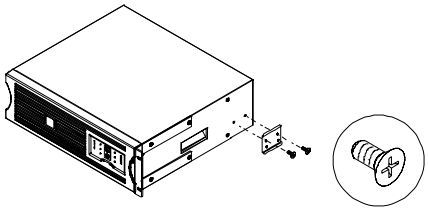


Bracket Position for a Four-Post Rack **Bracket Position for a Two-Post Rack**

If you are using a two-post rack, reposition the mounting brackets to the mid-point position before mounting the UPS in your rack.

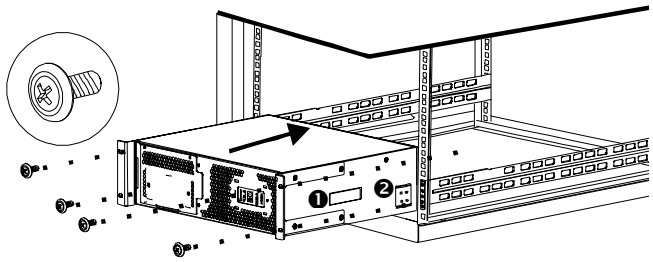
Check the rack to make sure it will not tip after moving the UPS mounting brackets.

- ***For Four-Post Racks:*** Attach a mounting cleat to each side of the UPS.



Load the UPS into the Rack

Due to the weight of the UPS, two people are required to install it in the rack.



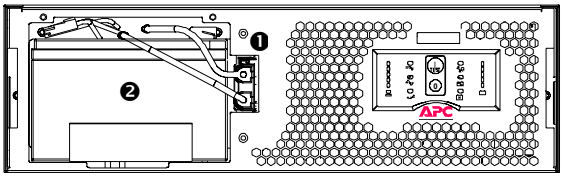
1. Use the handles ❶ on the side of the UPS to support the unit.
2. Each side of the UPS has a cleat ❷ that must slide into the groove on the rails. Slide the UPS into position.
3. Use the four (4) ornamental screws supplied with the UPS to attach the mounting brackets to the rack post.

Removing the UPS from the Rack

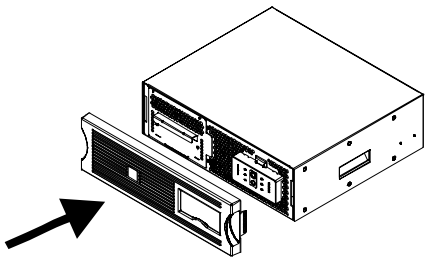
1. Remove the front panel bezel: Face the front of the battery pack and, using both hands, insert each index finger behind the lip of the curved section of the front panel bezel and pull towards you.
2. Remove the four (4) ornamental screws that secure the unit to the rack.
3. Grasp the handle located in the center of the UPS and pull the unit halfway out of the rack.
4. Use the handles on the sides of the unit for additional support and slide the unit out of the rack.

Connect the Batteries and Attach the Front Bezel

The UPS is shipped without its battery connected and the front panel bezel installed (it is packaged separately within the main box). You must connect the battery and install the plastic front panel bezel before the installation is complete.



1. Facing the front of the UPS, locate the battery cable (in the center of the unit) and remove the tape to expose the cable connector.
2. Locate the UPS battery connector ❶ which is to the right of the battery tray ❷ and recessed. Connect the battery cable connector to the UPS connector. Press firmly to ensure that the connection is tight. You will hear a "snap" when the connector is properly seated.
3. Tuck the white battery cable cord into the space above the battery connector.
4. Unpack the front panel bezel and hold it with



the cutout section on the right. Align the tabs on the side of the bezel with the slots on the front of the UPS and firmly snap it into place.

To connect an optional external battery pack(s) to the UPS, refer to the ***2U Battery Pack User's Manual*** for instructions. The SU1400 can support a maximum of ten (10) external battery packs.

Connect Power and Equipment to the UPS

Use the cable provided with your UPS to connect to the Computer Interface Port. DO NOT use a standard serial interface cable since it is incompatible with the UPS connector.

Refer to the *Software Installation Instruction Sheet*, included with the UPS, to determine whether your application requires using the plug and play (PnP) adapter. Do not use the adapter unless it is necessary.

- Plug the UPS power cord into an appropriate power source.
- Connect equipment to the UPS.
- Turn on all connected equipment (the equipment will not be powered until the UPS is turned on).
- Add any optional accessories. See the literature accompanying the accessory for details.
- Connect ground leads to the TVSS screw. The transient voltage surge suppression (TVSS) screw provides grounding through the UPS's power cord ground conductor. See ***Smart-UPS Rear Panel***, page 16, for the location of the screw. To make the connection, loosen the screw and connect the surge suppression device's ground lead. Tighten the screw to secure the lead.
- Check the site wiring fault indicator (located on the rear panel, see ***Smart-UPS Rear Panel***, page 16). It lights up if the UPS is plugged into an improperly wired AC power outlet. Wiring faults detected include missing ground, hot-neutral polarity reversal, and overloaded neutral circuit.

If the UPS indicates a site wiring fault, get a qualified electrician to correct the building wiring.

Turn on the UPS

Make sure the battery is connected before turning on the UPS!

- Press the UPS's on button, located on the front panel, to power-up your UPS. This will power-up connected equipment.

The UPS charges its battery whenever it is connected to utility power. The battery charges fully during the first four hours of normal operation. ***Do not*** expect full run time during this initial charge period.

- The unit performs a self-test automatically when turned on, and every two weeks thereafter (by default). Refer to ***User Configuration Items***, page 19 for details on changing the interval.

Install PowerChute Software (Optional)

For additional computer system security, install PowerChute UPS monitoring software. It provides automatic unattended shutdown capabilities on most major network operating systems. See the ***Software Installation Instruction Sheet*** included with the UPS**,** for details.

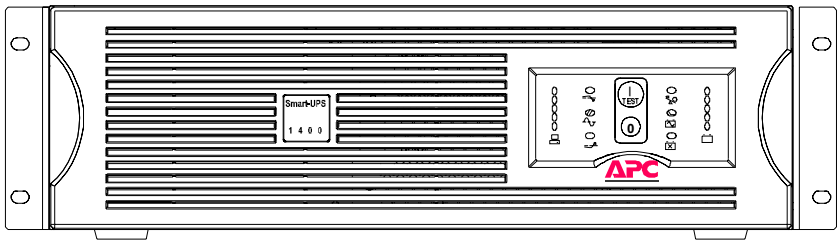
This UPS is equipped with an accessory slot. See the APC website (apcc.com) for available accessories.

If a standard accessory (such as an SNMP card) is installed on this UPS, follow the installation instructions included with the accessory.

Indicators and Controls on the Smart-UPS

The Smart-UPS has the power control and operating indicators located on the front panel. The rear panel has the input and output connectors.

Smart-UPS Front Panel



Switch On – Switch Off

To turn the UPS on: With the UPS plugged in, press and release the large, upper button labeled "I TEST" to supply power to the connected equipment. The equipment is immediately powered while the UPS performs a self-test.

To turn the UPS off: Press and release the small, lower button labeled "0" to turn off power to the connected equipment. It may be convenient to use the UPS as a master on/off switch for the connected equipment.

Whenever the UPS is plugged in and utility voltage is present, the charger maintains battery charge.

On-line Indicator

The on-line indicator illuminates when the UPS is supplying utility power to the connected equipment.

Load Bar Graph

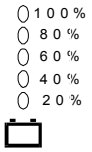
85%
67%
50%
33%
17%

The 5-LED display on the left of the front panel represents the power drawn from the UPS as a percentage of total capacity. For example, if three LEDs are lit, the load (connected equipment) is drawing between 50% and 67% of the UPS's capacity. If all five LEDs light, thoroughly test your complete system to make sure that the UPS will not become overloaded. In the graphic to the left, the battery capacity threshold is listed next to the LED (these are not shown on the actual UPS).

On Battery

During on-battery operation, the on-battery LED illuminates and the UPS sounds an audible alarm consisting of four beeps every 30 seconds. The alarm stops when the UPS returns to on-line operation. Refer to ***On-Battery Operation***, page 17, for details.

Battery Charge Bar Graph



The 5-LED display on the right of the front panel shows the present charge of the UPS's battery as a percentage of the battery's capacity. When all five LEDs are lit, the battery is fully charged. The LEDs extinguish, from top to bottom, as the battery capacity diminishes. The battery capacity threshold is shown in the figure to the left (it is not listed on the front panel display).

As a low battery warning, any LEDs illuminated (for the given capacity) will flash. The low battery warning setting can be changed from the rear panel (see ***Low Battery Warning Level***, page 17) or through the PowerChute software.

Overload

When the UPS is overloaded (that is, when the connected equipment exceeds the maximum specified in the "maximum load," section in ***Appendix A: Specifications***, page 25), the overload LED comes on and the UPS emits a sustained tone. The alarm remains on until the overload is removed. The UPS continues to supply power as long as it is on line and the breaker does not trip, but it will not provide power from batteries in the event of a utility voltage interruption. Disconnect nonessential equipment from the UPS to eliminate the overload. If a continuous overload occurs while the UPS is on battery, the UPS will turn off its output in order to protect itself from possible damage.

Self-Test

The UPS performs a self-test automatically when turned on, and every two weeks thereafter (by default). Refer to ***User Configuration Items***, page 19 for details on changing the interval. Automatic self-test eases maintenance requirements by eliminating the need for periodic manual self-tests. During the self-test, the UPS briefly operates the connected equipment on-battery. If the UPS passes the self-test, it returns to on-line operation.

If the UPS fails the self-test it immediately returns to on-line operation and lights the replace battery LED. The connected equipment is not affected by a failed test. Recharge the battery for 24 hours and perform another self-test. If it fails, the battery must be replaced. See ***Replacing the Battery***, page 21, for details.

How to Manually Initiate a Self-Test

Press and hold the on button (on the front panel) for a few seconds before the self-test will begin.

Replace Battery

If the battery fails a self-test, the UPS emits short beeps for one minute and the replace battery LED illuminates. (If the LED flashes, the battery is disconnected.) The UPS repeats the alarm every five hours. Perform the self-test procedure after the battery has charged for 24 hours to confirm the replace battery condition. The alarm will stop if the battery passes the self-test.

Voltage Trim

The voltage trim LED comes on to indicate that the UPS is compensating for a high utility voltage.

Voltage Boost

The voltage boost LED comes on to indicate that the UPS is compensating for a low utility voltage.

Low Battery

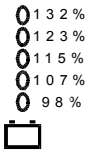
When the UPS is operating on-battery and the energy reserve of the battery runs low, the UPS beeps continuously (by default) until the UPS shuts down from battery exhaustion or returns to on-line operation. The low battery warning interval can be changed through software.

Cold Start

When the UPS is off and there is no utility power, use the cold start feature to apply power to the connected equipment from the UPS's battery. **Cold start is not a normal condition.**

- Press and hold the on button until the UPS beeps.
- Release the on button during the beep and the connected equipment is powered.

Utility Voltage Bar Graph



This UPS has a diagnostic feature that displays the utility voltage. With the UPS plugged into the normal utility power, press and hold the on button to see the utility voltage bar graph display. After a few seconds the 5-LED display on the right of the front panel shows the utility input voltage. Refer to the figure to the left for the voltage reading (the readings do not appear on the UPS).

The display indicates that the voltage is between the displayed value from the list and the next higher value. For example, with three LEDs lit, the input voltage is between 115 and 123 Vac.

If no LEDs come on and the UPS is plugged into a working AC power outlet, the line voltage is extremely low.

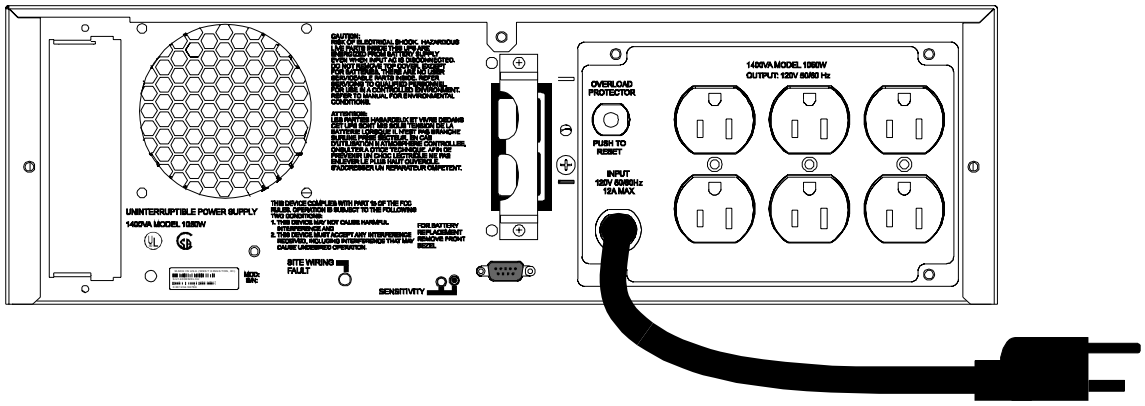
If all five LEDs come on, the line voltage is extremely high and should be checked by an electrician.

The UPS starts a self-test as part of this procedure. The self-test does not affect the voltage display.

Shutdown Mode (via software or an accessory)

In shutdown mode the UPS stops supplying power to the connected equipment, waiting for the return of utility power. If there is no utility power present, external devices (e.g., servers) connected to the computer interface or the accessory slot can command the UPS to shut down. This is normally done to preserve battery capacity after the graceful shutdown of protected servers. The UPS will scroll the front panel indicators sequentially in shutdown mode.

Smart-UPS Rear Panel



Computer Interface Port

Power management software and interface kits can be used with this UPS. **Use only interface kits supplied or approved by APC.** If used, connect the interface cable to the 9-pin computer interface port on the back panel of the UPS. Secure the connector's screws to complete the connection.

TVSS Screw

The UPS features a transient voltage surge-suppression (TVSS) screw for connecting the ground lead on surge suppression devices such as telephone and network line protectors. Refer to ***Connect Power and Equipment to the UPS***, page 10, for information.

Voltage Sensitivity

The UPS detects line voltage distortions such as spikes, notches, dips, and swells, as well as distortions caused by operation with inexpensive fuel-powered generators. By default, the UPS reacts to distortions by transferring to on-battery operation to protect the connected equipment. Where power quality is poor, the UPS may frequently transfer to on-battery operation. If the connected equipment can operate normally under such conditions, battery capacity and service life may be conserved by reducing the sensitivity of the UPS.

To reduce UPS sensitivity, press the Sensitivity button on the rear panel. Use a pointed object such as a pen to press the button. Press it once to set the UPS's sensitivity to **reduced**. Press it again to set the sensitivity to **low**. Press the button a third time to reset **normal** sensitivity. The Sensitivity can also be changed through software.

normal	When the UPS is set to normal sensitivity, the LED is brightly lit.
reduced	When it is set to reduced sensitivity, the LED is dimly lit.
low	When it is set to low sensitivity, the LED is off.

Battery Pack Connector

Use the battery pack connector to connect optional external battery pack(s). The SU1400RMXL supports up to ten (10) external battery packs.

Low Battery Warning Level

By default, the low battery warning occurs when there are approximately two minutes of on-battery run time remaining. This may not be enough time to gracefully shut down some protected computer systems.

To change the warning interval, press the rear panel Sensitivity button while pressing and holding the front-panel on button.

2 min. When the LED is brightly lit, the low battery warning interval is approximately two minutes.

5 min. When the LED is dimly lit, the low battery warning interval is approximately five minutes.

7 min. When the LED is off, the low battery warning interval is approximately seven minutes.

Site Wiring Fault Indicator

This indicator lights up when the UPS is connected to an improperly wired AC power outlet.

If the UPS indicates a site wiring fault, get a qualified electrician to correct the building wiring.

On-Battery Operation

The Smart-UPS will switch to battery operation automatically should the utility power fail. While running on battery, an internal alarm will sound (periodic beeps). Press the on button, on the front panel, to silence the UPS alarm (for the current alarm only). The PowerChute software allows you to change the audible indicator.

If the utility power does not return, the UPS will continue supplying power to the connected equipment until exhausted. A continuous beeping will sound approximately two minutes before the UPS's final low battery shutdown. If using a computer, you must manually save your files and power down before the UPS turns itself off, unless you are using PowerChute interface software that provides automatic, unattended shutdown.

How To Determine On-Battery Run Time

UPS battery life differs based on usage and environment. It is recommended that the battery/batteries be changed once every three years.

On-Battery Run Time (Minutes)		
Load (VA)	**Load (watts)**	**SU1400**
100	60	133
200	122	91
300	185	67
400	249	50
500	315	39
600	382	31
700	450	24
800	522	19
900	595	16
1000	670	13
1200	809	9
1330	900	7
1400	1050	6

Run Time (Minutes) with External Battery Packs (SU24RMXLBP2U)										
# of battery packs: Load (VA)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
700	70	130	210	280	350	420	490	560	640	720
1200	32	65	100	150	190	230	270	310	350	400
1400	23	47	70	100	140	170	200	240	270	300

User Configuration Items

Note: Setting these items requires optional software or hardware.			
Function	**Factory Default**	**User Selectable Choices**	**Description**
Automatic Self-Test	Every 14 days (336 hours)	Every 7 days (168 hours), On Startup Only, No Self-Test	Sets the interval at which the UPS will execute a self-test.
UPS ID	UPS_IDEN	Up to eight characters to define the UPS.	Use this field to uniquely identify the UPS for network management purposes.
Date of Last Battery	Manufacture Date	Date of Battery Replacement	Reset this date on battery replacement.
Minimum Capacity Before Return from Shutdown	0 percent	15, 50, 90 percent	The UPS will charge its batteries to the specified percentage before return from a shutdown.
Sensitivity	Normal	Reduced, Low	Set lower than normal sensitivity to avoid lowered battery capacity and service life in situations where the load can tolerate minor power disturbances.
Duration of Low Battery Warning	2 minutes	5, 7, 10 minutes	Sets the time before shutdown at which the UPS issues a low battery warning. Set higher than the default only if the OS needs the time for graceful shutdown.
Alarm Delay After Line Fail	5 second delay	30 second delay, At Low Battery Condition, No Alarm	To avoid alarms for minor power glitches, set the alarm delay.
Shutdown Delay	20 seconds	0, 80, 300, 600 seconds	Sets the interval between when the UPS receives a shutdown command and when shutdown occurs.
Synchronized Turn-on Delay	0 seconds	60, 180, 300 seconds	To avoid branch circuit overload, the UPS will wait the specified time after the return of utility power before turn-on.
High Transfer Point	132 Vac	138, 135, 129 Vac	To avoid unnecessary battery usage, set the High Transfer Point higher if the utility voltage is chronically high and the load is known to work well under this condition.
Low Transfer Point	103 Vac	97, 100, 106 Vac	Set the Low Transfer Point lower if the utility voltage is chronically low and the load can tolerate this condition.

Storage

Storage Conditions

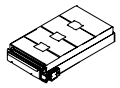
Store the UPS covered and flat (rack mount orientation) in a cool, dry location, with its battery fully charged. Disconnect any cables connected to the computer interface port to avoid unnecessarily draining the battery.

Extended Storage

At -15 to +30 °C (+5 to +86 °F), charge the UPS's battery every six months.
At +30 to +45 °C (+86 to +113 °F), charge the UPS's battery every three months.

Replacing the Battery

This UPS has an easy to replace hot-swappable battery tray. Battery replacement is a safe procedure, isolated from electrical hazards. You may leave the UPS and the protected equipment on for the following procedure. See your dealer or APC (refer to ***How To Contact APC***, page 4) for information on replacement battery cartridges.

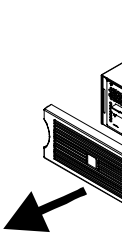
Unit	Replacement	Shape
UPS SU1400RMXL3U	RBC25	
Optional external battery pack SU24RMXLBP2U	RBC26	

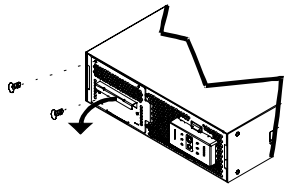
The SU1400RMXL and the optional, external battery pack use ***different*** replacement battery cartridges. The battery cartridges are not interchangeable.

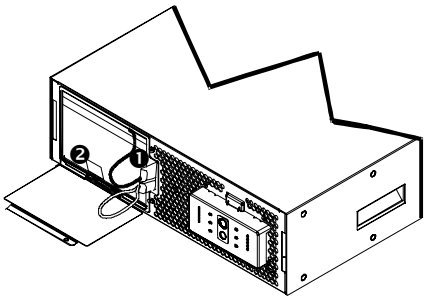
Battery Replacement Procedure

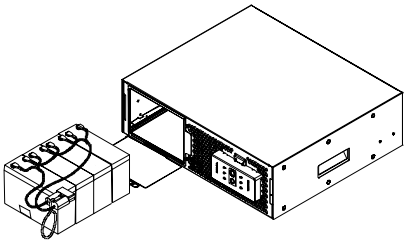
Please read ***Chapter 1: Safety Information***, page 1, before replacing the battery. Once the battery is disconnected, the loads are not protected from power outages.

1. The battery is accessible from the front of the UPS.
2. Be careful removing the battery—it is heavy.
3. This procedure requires a Phillips head screwdriver.









1. Face the front of the UPS and, using both hands, insert each index finger behind the lip of the curved section of the front bezel and pull towards you. The front bezel will unsnap.
2. Set the bezel aside.
3. Use a screwdriver or coin to remove the two (2) battery door screws and open the door.
4. Take out the white cord, which is tucked into the space above the battery connector ❶. Grasp the cord and pull firmly towards you to disconnect the battery.
5. Pull the battery out of the UPS by pulling the clear label ❷, *not* the white cord. The white cord is connected to the battery leads, not the body of the battery. (The battery consists of a string of four batteries.)
6. Return the battery to APC for recycling. (Refer to ***How To Contact APC***, page 4, for information.)
7. Supporting the new battery on the bottom, align it with the battery door opening and slide it into the compartment.
8. Remove the tape on the new battery connector to expose the cable's gray connector.
9. Locate the UPS battery connector ❶ which is to the right of the battery compartment and recessed. Connect the battery cable connector to the UPS connector. Press firmly to ensure that the connection is tight. You will hear a "snap" when the connector is properly seated.
10. Replace the two (2) screws and washers removed in step 3.
11. Tuck the white battery cable cord neatly into the space above the UPS connector.
12. Hold the front panel bezel with the cutout section on the right. Align the tabs on the side of the bezel with the slots on the front of the UPS and firmly snap it into place.

Troubleshooting

Use the chart below to solve minor UPS installation problems. Contact APC Technical Support Staff for assistance with complex UPS problems. See ***How To Contact APC***, page 4, for a location near you.

Problem and Possible Cause	Solution
UPS will not turn on.	
• ON button not pushed.	Press the ON button once to power the UPS and the load.
• UPS not connected to AC power supply.	Check that the power cable from the UPS to the utility power supply is securely connected at both ends.
• UPS input circuit breaker tripped.	Reduce the load on the UPS by unplugging equipment and reset the circuit breaker (on back of UPS) by pressing the plunger back in.
• Very low or no utility voltage.	Check the AC power supply to the UPS with a table lamp. If very dim, have the utility voltage checked.
• Battery not connected properly.	Confirm the battery connections.
UPS will not turn off.	
• Internal UPS fault.	Do not attempt to use the UPS. Unplug the UPS and have it serviced immediately.
UPS operates on-battery although normal line voltage exists.	
• UPS's input circuit breaker tripped.	Reduce the load on the UPS by unplugging equipment and reset the circuit breaker (on back of UPS) by pressing the plunger back in.
• Very high, low, or distorted line voltage. Inexpensive fuel powered generators can distort the voltage.	Move the UPS to a different outlet on a different circuit. Test the input voltage with the utility voltage display. If acceptable to the load, reduce the UPS's sensitivity. See ***Voltage Sensitivity***, page 16, for procedures.
UPS beeps occasionally.	
• Normal UPS operation.	None. The UPS is protecting the load.
UPS does not provide expected backup time.	
• The UPS's battery is weak due to recent outage or is near the end of its service life.	Charge the battery. Batteries require recharging after extended outages. Also, they wear faster when put into service often or when operated at elevated temperatures. If the battery is near the end of its service life, consider replacing the battery even if the replace battery indicator is not yet lit.
• The UPS is overloaded.	Check the UPS's load display. Unplug less needed equipment, such as printers.
Front panel indicators flash sequentially	
• The UPS has been shut down remotely through software or an optional accessory card.	None. The UPS will restart automatically when utility power returns.

All indicators are lit and UPS emits a constant beeping	
• Internal UPS fault.	Do not attempt to use the UPS. Turn the UPS off and have it serviced immediately.
All indicators are off and UPS is plugged into wall outlet.	
• The UPS is shut down and the battery is discharged from an extended outage.	None. The UPS will return to normal operation when the power is restored and the battery has a sufficient charge.
The replace battery light is lit.	
• Weak batteries.	Allow the batteries to recharge for at least four (4) hours then perform a self-test. If the problem persists after recharging, replace the batteries.
• Replacement batteries not connected properly.	Check that the battery connector is fully engaged.

Service

If the UPS requires service do not return it to the dealer! Follow these steps:

If you ordered a Smart-UPS SU1400RMXL3UX171 unit, please refer to the red addendum sheet (part number 990-1023) for contact information.

1. Review the problems discussed in ***Troubleshooting***, page 23, to eliminate common problems.
2. Verify that no circuit breakers are tripped. A tripped circuit breaker is the most common UPS problem!
3. If the problem persists, call customer service or visit the APC Internet Website (www.apcc.com).
   - Note the model number of the UPS, the serial number, and the date purchased. A technician will ask you to describe the problem and try to solve it over the phone, if possible. If this is not possible the technician will issue a Returned Material Authorization Number (RMA#).
   - If the UPS is under warranty, repairs are free. If not, there is a repair charge.
4. Pack the UPS in its original packaging. If the original packing is not available, ask customer service about obtaining a new set.

   Pack the UPS properly to avoid damage in transit. Never use Styrofoam beads for packaging. Damage sustained in transit is not covered under warranty.

Please refer to ***Appendix B: Transporting Your Smart-UPS*** , page 27, for important shipping instructions.

5. Mark the RMA# on the outside of the package.
6. Return the UPS by insured, prepaid carrier to the address given to you by Customer Service.

APPENDIX A: SPECIFICATIONS

	1400 VA (SU1400RMXL3U)
Normal input voltage	120 Vac single phase, 50 or 60 Hz (auto-selectable)
Input plug	NEMA 5-15P 6 ft line cord
Output receptacles	(6) NEMA 5-15R
Output voltage range (configured via software)	103 – 132 Vac (by default)
Input protection	Resettable circuit breaker
Transfer time	2 ms typical, 4 ms maximum
Capacity (maximum load)	1400 VA, 1050 Watts
On-battery output voltage	Pure sine wave output at 120 Vac ±5%, -10% after low battery warning, synchronized to utility line
On-battery frequency	50 or 60 Hz ±0.1 Hz: unless synchronized to utility during brownout
Voltage boost and Voltage trim operation	On-line operation for input 93 to 145 Vac will have output 103 to 132 Vac. Voltage Boost increases voltage 10% above input if 103 to 103 Vac, Voltage Trim reduces voltages 10% below input if 132 to 145 Vac. Transfer points are user adjustable using software.
Load power factor range, crest factor range	0.5 to 1.0 <5
Surge energy rating, peak current capability	480 Joules 6.5 kA
Normal, common mode clamping response time	0 ns, <5 ns, typical
Normal mode surge voltage let through (IEEE 587 CatA 6kV test)	<0.3% of peak, typical
Normal/common mode noise suppression at 1.0 MHz, 3 MHz, and 10 MHz	63/58, 54/58, 46/33 db
Protection	Overcurrent and short-circuit protected, latching shutdown on overload
Noise filter	Normal and common mode EMI/RFI suppression, 100 kHz to 10 MHz
Battery type	Four 12 V 9 AH Spill proof, maintenance free, sealed lead-acid
Typical battery life	3 – 6 years, depending on number of discharge cycles and ambient temperature
Typical recharge time	2 to 5 hours from total discharge
Ambient operation	10,000 ft (3000 meters) minimum elevation, 10 – 85% humidity non-condensing, 32 to 104 °F (0 to 40 °C)
Storage temperature	-15 to +45 ºC (+5 to +113 ºF)

Storage relative humidity	0 to 95%, non-condensing
Storage elevation	0 to +15,000 m (0 to +50,000 ft)
Electromagnetic immunity	IEC 801-2 level IV, 801-3 level III, 801-4 level IV, 801-5
Audible noise at 1 m (3 ft) from the surface of the unit	<48 dbA
Size (H x W x D)	(3U) 5.12 in. x 17 in. x 15.5 in. (13.0 cm x 43.2 cm x 39.4 cm)
Weight - net (shipping)	70 lb (89 lb) 31.8 kg (40.4 kg)
Safety approvals	Listed to UL 1778, certified to CSA 107.1
EMI verification	FCC/DOC Class A certified

Due to continuous improvement, specifications are subject to change without notice.

Regulatory Agency Approvals

LISTED 42C2
E95463

LR63938

警告使用者:
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Radio Frequency Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Shielded signal cables must be used with this product to ensure compliance with the Class A FCC limits.

APPENDIX B: TRANSPORTING YOUR SMART-UPS

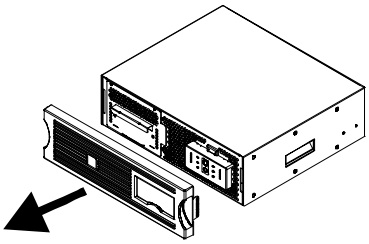
Follow these guidelines if you need to ship the UPS to another location. These guidelines apply whether you are transporting the UPS alone, rack mounted in an equipment cabinet, or installed in a system.

Always DISCONNECT THE BATTERIES before shipping the UPS to avoid damage during transport. (U.S. Federal Regulation *requires* that batteries be disconnected during shipment.) The batteries may remain in the UPS; they do not have to be removed.

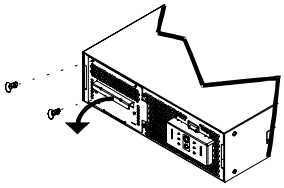
This requirement applies whether the UPS is shipped alone or installed in an equipment rack or system.

Graphics are not drawn to scale. They are shown for reference only.

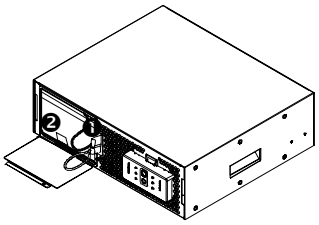
The battery compartment is accessed from the front panel of the UPS.



1. Remove the front bezel by grasping the finger clips on the side of the bezel and carefully loosening the four (4) snaps.



2. Use a screwdriver or coin to remove the two battery door screws and open the door.



3. Disconnect the front battery pack. Grasp the white cord and pull firmly to disconnect the connector from the battery compartment.
4. Tuck the white cord (that serves as a handle for the connector) neatly on top of the battery pack.
5. Close the battery door and replace the two (2) screws removed in step 2.
6. Leave the front bezel off unless the UPS is being transported in a rack.

Remember to connect the batteries once the UPS has arrived at its destination.